Claims

What is Claimed is:

1. A method for detection and assay on a microarray, said method comprising the steps of:

1) contacting a microarray having thereon a plurality of features each containing a first particular first nucleotide sequence with a mixture containing:

a) a first component comprising a cDNA reagent obtained from mRNA of a target sample, said cDNA having a capture sequence; and

b) a second component comprising a dendrimer having at least one first arm containing a label capable of emitting a detectable signal and at least one second arm having a second nucleotide sequence complementary to the capture sequence;

2) mixing the first and second components at a temperature and for a time sufficient to enable the first component to bind to the second component; and

3) incubating this mixture with said microarray to enable the first nucleotide sequence to bind to the first component, wherein such binding results in the feature emitting the detectable signal.

2. The method of claim 1 further comprising the step of forming the first component comprising the cDNA reagent by contacting the target sample mRNA with a quantity of a RT primer having the capture sequence, a reverse transcriptase, and

nucleotide under conditions sufficient for initiating reverse transcription of said mRNA into the cDNA reagent.

3. The method of claim 2 further comprising the step of purging excess unhybridized RT primer from said first component prior to incubation of said mixture.

4. The method of claim 3 wherein the purging step further comprises the step of passing the first component through a spin column media.

5. The method of claim 1 wherein the temperature sufficient to enable the second component to bind to the first component is from about 50 to 55°C.

6. The method of claim 1 wherein the temperature sufficient to enable the first component to bind to the first nucleotide sequence is from 42 to 65°C.

7. The method of claim 1 wherein the temperature sufficient to enable the first component to bind to the first nucleotide sequence is from about 4 to greater than 72 hours.

8. The method of claim 1 wherein the time sufficient to enable the second component to bind to the first component is from about 0.25 to 1 hour.

9. The method of claim 9 wherein the microarray and the mixture are incubated overnight at the temperature from about 42 to 65°C in a humidified chamber.

10. The method of claim 1, further comprising scanning the microarray for detecting the detectable signal and the hybridization pattern generated.

11. The method of claim 1, further comprising washing the microarray to purge dendrimers unattached to microarray after the incubation of the microarray and the mixture.

12. The method of claim 11, wherein the washing step further comprises:

washing the microarray with 2X SSC buffer containing 0.2% SDS at 55°C for about 10 minutes;

washing the microarray with 2X SSC buffer at about room temperature for about 10 minutes; and

washing the microarray with 0.2X SSC buffer at about room temperature for about 10 minutes.

13. The method of claim 1, wherein the mixture further comprising a hybridization buffer.

14. The method of claim 13, wherein the hybridization buffer further comprising 0.25 M $NaPO_4$, 4.5% SDS, 1 mM EDTA, and 1X SSC.

15. The method of claim 13 wherein the hybridization buffer further comprising 40% formamide, 4X SSC, and 1% SDS.

16. The method of claim 3 wherein the purging step further comprises the use of a hybridization chamber.

17. The method of claim 3 wherein the purging step further comprises the use of a hybridization station.

18. A method for detection and assay on a microarray, said method comprising the steps of:

1) incubating a mixture including:

i) a first component comprising a cDNA reagent obtained from mRNA of a target sample, said cDNA having a capture sequence; and

ii) a second component comprising a dendrimer having at least one first arm containing a label capable of emitting a detectable signal and at least one second arm having a second nucleotide sequence complementary to the capture sequence,

at a first temperature and for a time sufficient to induce the first component to bind to the second component and form a prehybridized cDNA-dendrimer complex;

2) contacting a microarray having thereon a plurality of features each containing a particular first nucleotide sequence with said mixture; and

3) incubating the microarray and the prehybridized cDNA-dendrimer complex at a second temperature and for a time sufficient to induce the prehybridized cDNA-dendrimer complex to bind to the first nucleotide sequence, wherein such binding results in the feature emitting the detectable signal whereby a hybridization pattern is generated on the microarray.

19. The method of Claim 18, wherein said cDNA is obtained using a spin column.